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APPLICANT: TOMASZ ONDRUSZ

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TRANSMITTAL OF PRIORITY DOCUMENT

Pursuant to 35 U.S.C. §119(b), Applicant hereby transmits a certified copy of United Kingdom Patent Application No. 0306734.5.

Consideration and entry of the enclosed certified copy of priority document is respectfully requested.

Respectfully submitted,

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CERTIFICATE OF MAILING UNDER 37 CFR 1.8
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, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) f the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of e Comptroller-General, hereby certify that annexed hereto is a true copy of the documents originally filed in connection with patent application GB0306734.5 filed on 24 March 03.

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1.	Your reference	AWP/P61901/000

2.	Patent application number *(The Patent Office will fill in this part)*	**0306734.5**	25MAR03 E794742-1 002882 P01/7700 0.00-0306734.5

3.	Full name, address and postcode of the or of each applicant *(underline all surnames)*	**HD SPORTS LTD Unit 1 Rutland Way Sheffield South Yorkshire S3 8DG**	2 4 MAR ...
	Patents ADP number *(if you know it)*	8S9S811001	
	If the applicant is a corporate body, give the country/state of its incorporation	**England**	

4.	Title of the invention	**A Computerised System for Devising a Training Scheme for a Sports Person**

5.	Name of your agent *(if you have one)*	**BOULT WADE TENNANT**
	"Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)*	**VERULAM GARDENS 70 GRAY'S INN ROAD LONDON WC1X 8BT**
	Patents ADP number *(if you know it)*	42001

6.	If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and *(if you know it)* the or each application number	Country	Priority application number *(if you know it)*	Date of filing *(day/month/year)*

7.	If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application	Number of earlier application	Date of filing *(day / month / year)*

8.	Is a statement of inventorship and of right to grant of a patent required in support of this request? *(Answer 'Yes' if:* *a) any applicant named in part 3 is not an inventor, or* *b) there is an inventor who is not named as an applicant, or* *c) any named applicant is a corporate body.* *See note (d))*	**yes**

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                          Description   **10**

                          Claim(s)   **4**

                          Abstract   -

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10.   If you are also filing any of the following, state
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                          Priority documents   -

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                          Statement of inventorship and right
                          to grant of a patent *(Patents Form 7/77)*   -

                          Request for preliminary examination
                          and search *(Patents Form 9/77)*   -

                          Request for substantive examination
                          (Patents Form 10/77)   -

                          Any other documents   -
                          (Please specify)

11	I/We request the grant of a patent on the basis of this application.
	Signature
	Date
	24 March 2003

12.	Name and daytime telephone number of person to contact in the United Kingdom	**A.W. Pluckrose** **020 7430 7500**

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A COMPUTERISED SYSTEM FOR DEVISING A
TRAINING SCHEME FOR A SPORTS PERSON

The present invention relates to a computerised
system for devising a training scheme for a sports
person.

It is a problem for an amateur sports person to
select a training scheme appropriate to his/her sport.
It is a fact that success in sports is highly related
to individual body measurements. For instance, it can
be seen that the anthropometrical differences between
sprinters are far less than between sprinters and the
general public. It is suggested that there is a
specific idealised anthropometric and physiological
profile for the sport of sprinting. There will be
different idealised physiological profiles for
different sports. General training schemes are widely
available, but it is not easy for the amateur sports
person to arrive at a training scheme suitable both
for his/her sport and also his/her current
physiological profile. The present invention aims to
address this.

In a first aspect the present invention provides
a computerised system for devising a training scheme
for a sports person comprising:
first computer means for processing data, the
first computer means being connected to a
telecommunications network to send and receive data
via the telecommunications network to and from a
plurality of remotely located computer means;
wherein:
the first computer means has a database which
stores for each of a plurality of sports a record of
an idealised physiological profile;

each sports person using the system inputs via
one of the plurality of remotely located computer
means a selection of a sport and, in response to
enquiries generated by the first computer means and
relayed to the sports person via the relevant remotely
located computer means, information concerning his/her
physiological profile; and

the first computer means compares the
physiological profile input by each sports person with
the idealised physiological profile for the relevant
sport and from this comparison formulates a training
regime which is relayed to the sports person via the
relevant remotely located computer means.

In a second aspect the present invention provides
a method of devising a training scheme for a sports
person comprising the steps of:

storing on a database on the first computer means
an idealised physiological profile for each of a
plurality of sports;

a sports person inputting to the first computer
means a selection of a sport and, in response to
enquiries generated by the first computer means,
information concerning his/her physiological profile;
and

a computer programme running on the first
computer means comparing the physiological profile
input by each sports person with the idealised
physiological profile for the relevant sport and from
the comparison formulating a training regime which is
then relayed to the sports person.

In a third aspect the present invention provides
a computerised system for devising a training scheme
for a sports person comprising:

first computer means for processing data, which
has a database which stores a record of an

preprogrammed physiological profile; wherein

each sports person using the system inputs, in response to enquiries generated by the first computer means, information concerning his/her physiological

5   profile;

each sports person using the system can vary the preprogrammed physiological profile by inputting a target or targets selected from options provided by the first computer means;

10   the first computer means compares the physiological profile input by each sports person with the varied physiological profile selected by the sports person and from this comparison formulates a training regime which is relayed to the sports person.

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An example of a preferred embodiment of computerised system according to the present invention will now be described with reference to the

20   accompanying figure.

In the accompanying figure there can be seen a server 10 with accompanying computer terminal 11. The server 10 is connected via a telecommunication

25   network, e.g. the Internet, to remotely located personal computers 12, 13, and 14. In the example given the server 10 has a website which can be accessed via the Internet and users of the system use web-browser software on the personal computers 12, 13

30   and 14 to access the website hosted by the server 10.

On the server 10 there is maintained a database which for each of the plurality of sports maintains a record of an idealised physiological profile for the

35   sport.

To obtain a meaningful physiological profile we

can use items such as:

- Maximum capacity to transport oxygen to tissues (VO_{2max}),
- % of VO_{2max} that may be maintained without accumulation of lactate (OBLA),
- Maximum strength measured as the greatest weight that can be lifted just once (1-RM),
- Maximum power measured as the work output in a unit of time (POW)
- Core strength measured as the maximum number of sit-ups (COR1), push-ups(COR2) and crunchies (COR3) that can be performed without rest.
- Local muscular endurance (LME).

As an example, an elite marathon runner is likely to have relatively high VO_{2max}, very high OBLA, low 1-RM, low POW, low COR1, low COR2, low COR3 and low LME when compared to a gymnast, or a figure skater.

Similarly, the marathon runner will have a different psychological, nutritional and injury profile from the gymnast or an overweight person due to the dissimilar demands of the respective sports and goals.

In the system, the stored idealised physiological profile for a sport is used to determine where the weakness in a particular athlete lies, and an ongoing training and assessment schedule is generated.

When a sports person first accesses the website hosted by the server 10 he/she is asked to supply the following information (hypothetical figures are given as illustrations):

Variable	Athlete

Gender	Male
Age	24
Height (m)	1.76
Resting Heart rate (bpm)	34
Weight (kg)	76
Sport	Long distance runner (10 km+)

The server 10 then retrieves from the database the idealised physiological profile for the sport selected by the sports person, in this case long distance running. The retrieved measurements of the idealised profile are then scaled having regard to the body weight of the sports person, the gender and age. The resulting figures for these hypothetical examples are given in the table below.

Variable	Idealised Measurements
VO_{2max} (mlO_2/kg)	80
OBLA (% VO_{2max})	65
1-RM (kg)	385
Aerobic Power (W/kg)	28
Core strength	100
LME (mmol/l)	2.25

The sports person is prompted by a visual display on the local personal computer to input measurements of his/her Vo_{2max}, OBLA, 1-RM, POW, COR1, COR2, COR3 and LME. The server 10 then calculates from the input POW and weight information an aerobic power figure and from the input COR1, COR2 and COR3 figures a core strength figure. Then the server 10 makes a

comparison between the current physiological profile
of the sports person and the idealised physiological
profile for the selected sport (normalised by weight,
age and gender) as illustrated by the table below.

Variable	Optimum value	Actual Value	% difference
VO_{2max} (ml/kg)	80	60	75
OBLA	65	60	92
Aerobic Power (W/kg)	26	21.7	83.5
1-RM squat	85kg	75	88
Core strength	100	95	95
LME	2.25	2.30	102.2

From the comparison the system can establish that
the most important area to improve for this particular
athlete is VO_{2max}. The system would now recommend a
training regime to maximise the key component.

Optimising the VO_{2max} can be achieved by
establishing a training regime that has a high volume
and relatively low intensity. For running, the scheme
follows that shown below (which would be relayed to
the sports person as information displayed on the
video display unit of his/her personal computer and
printed locally by the sports person).

Factor (component)	Lower Value	Upper Value
Sessions/week (volume)	3	4
Distance % of competition (volume)	150	180
Intensity % of maximal heart reserve (intensity)	65	75

The volume of training is evaluated as shown:
$Volume_{run}$ = Sessions * Distance, where
Sessions = number of sessions per week and distance =
distance run in each session.

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In the hypothetical example, the athlete is
recommended to complete 3 training sessions with
distance = 150 % of competition distance (i.e. 15
km). There should be 2 days rest between training.

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The intensity is evaluated as a percentage of
Maximum output from following the Karvonen formula:
$THR = HR_{rest} + INT * (HR_{max} - HR_{rest})$, where
THR = training heart rate

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INT = Intensity percentage/100 (e.g. 80 % = 0.8)
HR_{rest} = Resting heart rate and
HR_{max} = Maximal heart rate (this is either available
from a maximal test or can be estimated from 220- age

20

(years))
For our athlete, the THR = 34 + 0.70 * ((220- 24) -
34) = 163 beats/minute

The actual training run can be done within a band

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of 5 beats/minute either side of THR. (at this level
of athlete, one would expect that a heart rate monitor
is used).

In a variation of the system the sports person is

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assessed for symptoms of overtraining, and research
has shown that psychological assessment tools such as
a Profile of Mood States (POMS) can be used to
indicate risk of overtraining.

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Mood data for the sports person are obtained by
appropriate questions relayed via the local personal
computer. Categories are established as shown in the

table below. The base value represents the average value from all of the data obtained during the off-season. For details of the specific method for eliciting data from a profile of mood states
5   questionnaire see Terry *et al.* (1999).

Mood dimension	Base Value	Last session value
Anger	4	6
Tension	5	8
Vigour	9	4
Depression	1	5
Fatigue	2	7
Total	21	30

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    The system compares current POMS scores to historical base values (obtained during an off-season). Two tests are used:

20   Test 1: is the current total POMS score more than 50% above reference values?
In our case, 21 + 50% = 31.5 indicating that it is not.

25   Test 2: Is the current measure of Fatigue higher than current measure for Vigour?
In our case this is true.

The overtraining risk is used to modify the proposed
30   training schedule by reducing the recommended training volumes and training intensities by the percentage figures below (overtraining risk is 0% if the answers to both of the above questions are "no", 50% if one answer is "yes" and one is "no" and 100% if both
35   answers are "yes").

Overtraining Risk %	Training Volume	Training Intensity
0	0	0
50	15	20
100	60	50

Whilst above the invention has been described as a distributed system with a central server 10 accessed via the Internet by personal computers 12, 13, 14 using web browser, the system could be provided by a single stand-alone computer into which data is directly input (i.e. not via a telecommunications network). Also the personal computers described above could be replaced by handheld computers (sometimes called personal digital assistants or palm top computers) or mobile telephones or interactive digital television units all of which have enough computing power to function as local computer means. The system could automatically update diaries held by such devices with training schedules, menu listings, etc.

The system could be adapted to be used by trainers and coaches in conjunction with sportsmen and women by allowing each trainer or coach to vary the idealised physiological profile in a way of his/her choosing so that the system then compares the sport person's actual physiological profile with the varied profile set by the coach or trainer.

Whilst above the invention has been discussed with reference to the system having an idealised profile stored for each sport, in another aspect the invention could provide a system to be used for general fitness requirements in which the user could set his/her own idealised profile and then the system

use this to compare with the user's current physiological profile in order to devise a training scheme. This would be done by establishing a default profile and then allowing the user to adjust it using a menu of options such as 'loose 10% of body weight' or 'tone up muscles' or 'reduce the time for a marathon by 10 minutes' or even simple options such as 'sleep better'. These commands would be interpreted by the system as adjustments to the default physiological profile and then the system would act as above and compare the user's actual physiological profile (determined as described above) with the modified default profile and use the differences to devise a training regime.

CLAIMS

1. A computerised system for devising a training scheme for a sports person comprising:
   first computer means for processing data, which has a database which stores for each of a plurality of sports a record of an idealised physiological profile; wherein:
   each sports person using the system inputs a selection of a sport and, in response to enquiries generated by the first computer means, information concerning his/her physiological profile; and
   the first computer means compares the physiological profile input by each sports person with the idealised physiological profile for the relevant sport and from this comparison formulates a training regime which is relayed to the sports person.

2. A system as claimed in claim 1 wherein:
   the first computer is connected via a telecommunications network to a plurality of remotely located computer means; and
   each sports person uses one of the plurality of remotely located computer means to input data to the first computer means via the telecommunications network and to receive enquiries and the formulated training regime from the first computer means via the telecommunications network.

3. A system as claimed in claim 1 or claim 2 wherein:
   the first computer means for each sports person scales the stored idealised physiological profile for the selected sport having regard to the weight of the sports person and compares the input physiological profile with the scaled identical physiological profile when formulating the training regime.

4.   A system as claimed in any one of claims 1 to 3 wherein:

the first computer means for each sports person scales the stored idealised physiological profile for the selected sport having regard to the gender of the sports person and compares the input physiological profile with the scaled idealised physiological profile when formulating the training regime.

5.   A system as claimed in any one of the preceding claims wherein:

the first computer means for each sports person scales the stored idealised physiological profile for the selected sport having regard to the age of the sports person and compares the input physiological profile with the scaled idealised physiological profile when formulating the training regime.

6.   A system as claimed in any one of the preceding claims wherein:

each stored record of an idealised physiological profile comprises measurements taken from the set of maximum capacity to transport oxygen to tissues; percentage of maximum oxygen transport capacity that may be maintained without accumulation of lactate; greatest weight that can be lifted once; maximum power; maximum number of sit-ups performed without rest; maximum number of push-ups performed without rest; maximum number of crunchies performed without rest; and local muscle endurance; and

the first computer means generates enquiries relayed to the sports person which require data matching the measurements stored for the idealised physiological profile.

7.   A system as claimed in any one of the

preceding claims wherein:

the training regime formulated by the first computer means comprises recommendations for training session frequency.

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8.   A system as claimed in any one of the preceding claims wherein:

the training regime formulated by the first computer means comprises recommendations for heart

10   rate during training.

9.   A system as claimed in any one of the preceding claims wherein:

each sports person inputs periodically, in

15   response to enquiries generated by the first computer means, data to establish a psychological profile for the sports person; and

the first computer means compares each input psychological profile for each sports person with a

20   stored base psychological profile for the sports person and dependent on the comparison can modify the training regime formulated by the first computer means.

25   10. A method of devising a training scheme for a sports person comprising the steps of:

storing on a database on the first computer means an idealised physiological profile for each of a plurality of sports;

30   a sports person inputting to the first computer means a selection of a sport and, in response to enquiries generated by the first computer means, information concerning his/her physiological profile; and

35   a computer programme running on the first computer means comparing the physiological profile input by each sports person with the idealised

physiological profile for the relevant sport and from the comparison formulating a training regime which is then relayed to the sports person.

5 11. A computerised system for devising a training scheme for a sports person comprising:
    first computer means for processing data, which has a database which stores a record of an preprogrammed physiological profile; wherein
10   each sports person using the system inputs, in response to enquiries generated by the first computer means, information concerning his/her physiological profile;
    each sports person using the system can vary the
15 preprogrammed physiological profile by inputting a target or targets selected from options provided by the first computer means;
    the first computer means compares the physiological profile input by each sports person with
20 the varied physiological profile selected by the sports person and from this comparison formulates a training regime which is relayed to the sports person.

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